

CLAIMS

What is claimed is:

Claim 1. A process for time-based proportional control of chemical values in a water treatment system wherein a measured signal value is generated, comprising the steps:

selecting an offset sensitivity value; and

calculating a setpoint offset value (SOV) to determine said measured signal value;

wherein said measured signal value approximates an ideal proportional control response.

Claim 2. A process in accordance with claim 1 wherein: said setpoint offset value is calculated according to the formula

$$SOV = (SD/PB) * OS * PB$$

where SD equals the sustained deviation from setpoint

PB equals Proportional Band Width

OS equals Offset Sensitivity Value.

Claim 3. In a process for time-based proportional control of chemical values in a water treatment system wherein a

1 measured signal value is generated, the improvement comprising:

2 modifying said measured signal value to be within a range
3 defined by a particular proportional band width;

4 verifying that said signal value lies within a hysteresis
5 value about a particularly defined setpoint;

6 measuring said signal value to confirm that said signal
7 value is steady or retreating from said setpoint during a
8 selected time duration ;

9 selecting an offset sensitivity value; and

10 calculating a setpoint offset value (SOV) according to the
11 formula

12
$$\text{SOV} = (\text{SD}/\text{PB}) * \text{OS} * \text{PB}$$

13 where SD equals the sustained deviation from setpoint

14 PB equals Proportional Band Width

15 OS equals Offset Sensitivity Value;

16 wherein said measured signal value approximates an ideal
17 proportional control response.

18
19 Claim 4. A process in accordance with claim 3 wherein:
20 said particular proportional band width is between about
21 5 and 500 mV.

22
23 Claim 5. A process in accordance with claim 3 wherein:

1 said particular proportional band width is between about
2 0.1 and 5.0 pH units.

3

4 Claim 6. A process in accordance with claim 3 wherein:
5 said particular proportional band width is between about
6 10 and 5000 microsiemens.

7

8 Claim 7. A process in accordance with claim 3 wherein:
9 said time base is between about 15 and 600 seconds.

10

11 Claim 8. A process in accordance with claim 3 wherein:
12 said selected time duration is a multiple of the time
13 base.

14

15 Claim 9. A process in accordance with claim 3 wherein:
16 said hysteresis value is between about 0 and 10 mV.

17

18 Claim 10. A process in accordance with claim 3 wherein:
19 said hysteresis value is between about 0 and 1.0 pH units.

20

21 Claim 11. A process in accordance with claim 3 wherein:
22 said particular proportional band width is between about
23 0 and 1000 microsiemens.

1 Claim 12. A process in accordance with claim 3 wherein:
2 said setpoint is between about 150 and 780 mV.

3
4 Claim 13. A process in accordance with claim 3 wherein:
5 said setpoint is between about 2 and 12 pH units.

6
7 Claim 14. A process in accordance with claim 3 wherein:
8 said setpoint is between about 1000 and 4000 microsiemens.

9
10 Claim 15. A process in accordance with claim 3 wherein:
11 said offset sensitivity value is within the range of about
12 0 and 100 percent.

13

14

15

16

17

18

19

20

21

22

23